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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

DANIEL R. CALDWELL ET AL.

Serial No. 10/706,762 (TI-36721)

Filed November 10, 2003

For: CHEMICAL MECHANICAL POLISHING SLURRY
PUMP MONITORING SYSTEM AND METHOD

Art Unit 3723

Examiner Dung v. Nguyen

Customer No. 23494

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Jav M. Cantor, Reg. No. 19,906

Sir:

BRIEF ON APPEAL

REAL PARTY IN INTEREST

The real party in interest is Texas Instruments Incorporated, a Delaware corporation with offices at 7839 Churchill Way, Dallas, Texas 75251.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals and/or interferences.

STATUS OF CLAIMS

This is an appeal of claims 11 to 20, all of the rejected claims. Claims 1 to 10 have been cancelled. Please charge any costs to Deposit Account No. 20-0668.

STATUS OF AMENDMENTS

A non-amending response was filed after a final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

The claims invention relates to a chemical mechanical polishing monitoring system. The system includes a peristaltic pump 108 operable to deliver a slurry 110 to a polishing pad 104. A controller 112 is operable to send a drive voltage to the peristaltic pump based on a desired volumetric flow rate for the slurry. A rotation sensing device 200 is coupled to a rotating shaft 206 of the peristaltic pump and operable to sense a rotation of the peristaltic pump. The rotation sensing device is further operable to generate a voltage 304 indicative of the rotation of the peristaltic pump. A computer 116 is coupled to the rotation sensing device and the controller and receives the drive voltage from the controller, the voltage from the rotation sensing device and compares the voltage to a threshold voltage that is based, in part, on the drive voltage in order to monitor the peristaltic pump during use. The computer can generate a message based on the comparison. Also, the rotation sensing device can be one of a tachogenerator, an encoder, a fiber optic detector, and a digital counter.

The invention also relates to a chemical mechanical polishing monitoring method which includes the steps of sending a drive voltage to a pump (112 to 108), the drive voltage based on a desired volumetric flow rate for a slurry (from look-up table 113), delivering, via the pump

(108), the slurry (110) to a polishing pad (104), sensing a rotation of the pump (200), generating a signal indicative of the rotation of the pump (200 and comparing the signal to a threshold signal that is based, in part, on the drive voltage in order to monitor the pump during use (116). A message can be generated based on the comparison. The pump can be a peristaltic pump. The sensing of a rotation of the pump can comprises sensing a rotation of the pump via a tachogenerator. The sensing of a rotation of the pump can comprise sensing a rotation of the pump via an encoder, a fiber optic detector or a digital counter.

GROUND OF REJECTION

Claims 11 to 16 and 18 were rejected under 35 U.S.C. 102(b) as being anticipated by Melcer (U.S. 6,163,341).

Claims 17, 19 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Melcer.

ARGUMENT

Claims 11 to 16 and 18 were rejected under 35 U.S.C. 102(b) as being anticipated by Melcer (U.S. 6,163,341). The rejection is without merit.

It is basic that, in order for a claim to be rejectable under 35 U.S.C. 102, a single reference must contain each and every claimed feature and each and every function claimed of each claimed feature. This is not the case herein.

Claim 11 requires, in addition to the controller, a computer coupled to the rotation sensing device and the controller, the computer operable to: receive the drive voltage from the controller; receive the voltage from the rotation sensing device; and compare the voltage to a

threshold voltage that is based, in part, on the drive voltage in order to monitor the peristaltic pump during use. No such device is found in Melcer.

In addition, Melcer describes a system that monitors the slurry inlet pressure to the pump and uses the inlet pressure to control the pump. In particular, “[T]he pump controller uses the specified flow rate, the sensed inlet supply pressure, and known relation ship between the pump speed and volume output to compute the required pump speed: (col. 2, lines 64 to 67). Claim 11 limits the invention to a system that sends a drive voltage based upon volumetric flow rate to the pump. The sensing device monitors the speed of the pump and produces a voltage dependent on the pump speed. This voltage is then compared to a threshold voltage to monitor the pump during use. The threshold voltage is dependent on the drive voltage. A comparison of claim 11 with the cited reference reveals that while both describe a CMP pump control system, the configuration of each system and the various methods of operation a patentably distinct. In particular, Melcer does not describe or teach sending a drive voltage base don volumetric flow rate to the pump and comparing a voltage dependent on the actual speed of the pump with a threshold voltage that depends on the drive voltage.

Claims 12 to 16 and 18 depend from claim 11 and therefore define patentably over Melcer for at least the reasons presented above with reference to claim 11.

Claim 12 further limits claim 11 by requiring that the computer be further operable to generate a message based on the comparison. No such structure is found in Melcer either alone or in the combination as claimed.

Claim 14 is a method claim to the above described system and comprises the limitations of sending a drive voltage to a pump, the drive voltage based on a desired volumetric flow rate for a slurry, delivering, via the pump, the slurry to a polishing pad; sensing a rotation of the

pump; generating a signal indicative of the rotation of the pump; and comparing the signal to a threshold signal that is based, in part, on the drive voltage in order to monitor the pump during use. As described above, the cited reference describes a pump controller that uses the specified flow rate, the sensed inlet supply pressure, and known relationship between the pump speed and volume output to compute the required pump speed. The instant method of claim 14 is not described in Melcer..

Claims 15, 16 and 18 depend from claim 14 and therefore define patentably over Melcer for at least the reasons presented above with reference to claim 14.

Claim 15 further limits claim 14 by requiring the step of generating a message based on the comparison. No such step is taught by Melcer.

Claims 17, 19 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Melcer. The rejection is without merit.

Claims 17, 19 and 20 depend from claim 14 and therefore define patentably over Melcer for at least the reasons presented above with reference to claim 14.

CONCLUSIONS

For the reasons stated above, reversal of the final rejection and allowance of the claims on appeal is requested that justice be done in the premises.

Respectfully submitted,



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CLAIMS APPENDIX

The claims on appeal read as follows:

11. A chemical mechanical polishing monitoring system, comprising:
 - a peristaltic pump operable to deliver a slurry to a polishing pad;
 - a controller operable to send a drive voltage to the peristaltic pump based on a desired volumetric flow rate for the slurry;
 - a rotation sensing device coupled to a rotating shaft of the peristaltic pump and operable to sense a rotation of the peristaltic pump, the rotation sensing device further operable to generate a voltage indicative of the rotation of the peristaltic pump; and
 - a computer coupled to the rotation sensing device and the controller, the computer operable to:
 - receive the drive voltage from the controller;
 - receive the voltage from the rotation sensing device; and
 - compare the voltage to a threshold voltage that is based, in part, on the drive voltage in order to monitor the peristaltic pump during use.
12. The system of Claim 11, wherein the computer is further operable to generate a message based on the comparison.
13. The system of Claim 11, wherein the rotation sensing device is selected from the group consisting of a tachogenerator, an encoder, a fiber optic detector, and a digital counter.
14. A chemical mechanical polishing monitoring method, comprising:
 - sending a drive voltage to a pump, the drive voltage based on a desired volumetric flow rate for a slurry;
 - delivering, via the pump, the slurry to a polishing pad;

sensing a rotation of the pump;
generating a signal indicative of the rotation of the pump; and
comparing the signal to a threshold signal that is based, in part, on the drive voltage in order to monitor the pump during use.

15. The method of Claim 14, further comprising generating a message based on the comparison.

16. The method of Claim 14, wherein the pump comprises a peristaltic pump.

17. The method of Claim 14, wherein sensing a rotation of the pump comprises sensing a rotation of the pump via a tachogenerator.

18. The method of Claim 14, wherein sensing a rotation of the pump comprises sensing a rotation of the pump via an encoder.

19. The method of Claim 14, wherein sensing a rotation of the pump comprises sensing a rotation of the pump via a fiber optic detector.

20. The method of Claim 14, wherein sensing a rotation of the pump comprises sensing a rotation of the pump via a digital counter.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None